

Fredericksburg and Spotsylvania

National Park Service
U.S. Department of the Interior

National Military Park
Virginia



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Bat Population Monitoring and White-nose Syndrome

Why is the park interested in bats?

Bats are an important part of ecosystems and food webs. They consume huge numbers of insects every night, filling a unique ecosystem role as nocturnal insect predators. Unfortunately, a new disease called white-nose syndrome is affecting bats across the United States. To better protect bats, the park is studying how local bat populations are changing.

Do bats help people?

Due to their massive appetites, bats are a valued component of biodiversity. Bats can eat more than half their body weight every night—that's hundreds to thousands of bugs! Some of these insects, such as mosquitoes, can transmit human diseases. Scientists also estimate that bats save U.S. farmers almost \$3.7 billion per year by eating crop-destroying insects.

What's white-nose syndrome? Which bats get the disease?

White-nose syndrome is a bat disease caused by the fungus *Pseudogymnoascus destructans*. The disease is named for the white fungal growth that occurs on bats' faces and wings. The fungus was first observed in 2006 in a New York cave and is

believed to have originated in Europe. In Virginia, the disease has reduced some bat populations by more than 90%.

Many species of bats spend the winter hibernating in caves, mines, buildings, or rock outcrops. Bats that hibernate in caves and mines are most likely to get the disease. Other bat species migrate south to warmer climates in the winter. These bats, in general, are not susceptible to the fungus.

How are bats infected?

Once introduced, the white-nose fungus can persist in the cold, humid environment of caves and mines, infecting bats when they return to hibernate. The fungus can also spread from bat to bat when they touch. Bats that hibernate in large groups are most susceptible. Humans don't get the disease but can spread it from cave to cave on contaminated clothing or equipment.

What happens when a bat is infected?

Ongoing studies suggest that the fungus irritates and damages the skin of an infected bat. The infection causes the bat to wake up more frequently during winter hibernation. When bats wake up, they use precious energy to stay warm. If they wake up too frequently, they can die of starvation before spring arrives.

Want to learn more about bats? Let's bust some bat myths!

Are bats blind?

No! Bats found in Virginia use echolocation to find their food. That said, they can still see, particularly in dark conditions. Some tropical bats can see better than people!

Do bats get stuck in your hair?

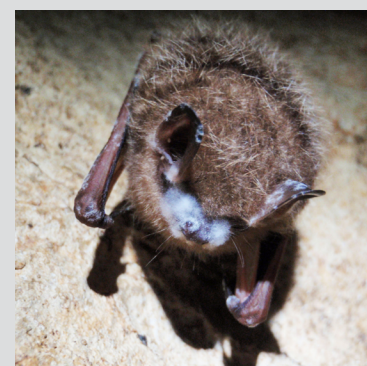
Bats have no desire to land on your head! Even in the dark, they can use their well-adapted eyesight and amazing echolocation to avoid hitting you.

Do bats want to suck your blood?

No, they don't. There are no vampire bats in the United States. Vampire bats do live in Central and South America, but they generally feed on cattle.

Aren't bats a little bit evil?

Not at all! Bats are gentle, intelligent, and social creatures. For example, some mother bats group together in special roosts after having babies. When a mom leaves the "maternity roost" to hunt, the other moms will take care of her baby until she returns.



A hibernating tri-colored bat showing symptoms of white-nose syndrome. NPS Photo.

How do biologists study bats? What have they learned about bats in the park?

Biologists have creative ways of studying these unique animals. Bats use echolocation to navigate and catch insect prey during the dark of night. People can't hear these bat calls, so biologists use special microphones, called acoustic detectors, to record the sounds. By analyzing the bat calls, biologists can identify which specific bat species are present in an area during certain times of the year.

From 2016-2017, scientists used acoustic detectors to document 11 species of bats in the park (see graph below). The most commonly detected bat species was the big brown bat (*Eptesicus fuscus*). Interestingly, bat activity was highest in the most urbanized area of the park (Fredericksburg Battlefield). In this area, big brown bats are likely abundant. Big brown bats can easily adapt to urban areas and are less impacted by white-nose syndrome than other bats.



Acoustic detectors, like this one, record bat calls over a period of weeks or months. Biologists then use special computer programs to analyze the calls. Since different species use unique calls, biologists can identify which species are present based on sounds alone. NPS photo.

Researchers are also capturing bats and using tiny radio-tracking devices to follow bats to important habitats. Park managers can then better protect these areas. For example, several species of bats prefer mature forests as feeding areas. Mature forests are rare in the Fredericksburg area, suggesting that the older forests that remain are likely serving as critical bat habitat.

What about rare bat species?

During the summer, there are four rare bat species that can be found in the park. These include the little brown bat (*Myotis lucifugus*), the tri-colored bat (*Perimyotis subflavus*), the Indiana bat (*Myotis sodalis*), and the northern long-eared bat (*Myotis septentrionalis*). The latter two are protected by the Endangered Species Act and are not common in the park. All of these rare species are sensitive to white-nose syndrome.



After a bat is captured, biologists can check the wings for damage from white-nose syndrome. NPS photo.

These rare bats spend their summer days roosting in tree cavities and snags, under tree bark, or in buildings. At night, they emerge to feed across the park's landscape. During the fall, these species of bats usually travel to caves or mines, where they hibernate for the winter. In these caves and mines, they can contract white-nose syndrome and die.

What is the park doing to help bats?

The data being collected on bats will help park managers conserve bats and their habitat. Protecting hollow trees and snags where bats raise their young and preserving mature hardwood forests will help reduce the impacts of the disease. White-nose syndrome remains an extraordinarily dangerous threat to bat populations—sadly, some species may ultimately disappear from the region. To learn more about bats, visit www.nps.gov/subjects/bats or www.whitenosesyndrome.org.

